



SEQUENCE LISTING

<110> SMEAL, TOD R.
CALLOW, MARINELLA G.
JALLAL, BAHJA
ZOZULYA, SERGEY
GISHIZKY, MIKHAIL L.

<120> GEF-H1b: BIOMARKERS, COMPLEXES, ASSAYS AND THERAPEUTIC
USES THEREOF

<130> 034536-0407

<140> 10/611,671

<141> 2003-07-02

<150> 60/460,053

<151> 2003-04-04

<150> 60/393,600

<151> 2002-07-05

<160> 52

<170> PatentIn Ver. 2.1

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<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic
polynucleotide

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<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic
polypeptide

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          20                      25                      30

```

```

Ser Leu Arg Ser Lys Thr Thr Ile Arg Glu Arg Pro Ser Ser Ala Ile
    35                      40                      45

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```

Tyr Pro Ser Asp Ser Phe Arg Gln Ser Leu Leu Gly Ser Arg Arg Gly
    50                      55                      60

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Arg Ser Ser Leu Ser Leu Ala Lys Ser Val Ser Thr Thr Asn Ile Ala
 65 70 75 80
 Gly His Phe Asn Asp Glu Ser Pro Leu Gly Leu Arg Arg Ile Leu Ser
 85 90 95
 Gln Ser Thr Asp Ser Leu Asn Met Arg Asn Arg Thr Leu Ser Val Glu
 100 105 110
 Ser Leu Ile Asp Glu Ala Glu Val Ile Tyr Ser Glu Leu Met Ser Asp
 115 120 125
 Phe Glu Met Asp Glu Lys Asp Phe Ala Ala Asp Ser Trp Ser Leu Ala
 130 135 140
 Val Asp Ser Ser Phe Leu Gln Gln His Lys Lys Glu Val Met Lys Gln
 145 150 155 160
 Gln Asp Val Ile Tyr Glu Leu Ile Gln Thr Glu Leu His His Val Arg
 165 170 175
 Thr Leu Lys Ile Met Thr Arg Leu Phe Arg Thr Gly Met Leu Glu Glu
 180 185 190
 Leu His Leu Glu Pro Gly Val Val Gln Gly Leu Phe Pro Cys Val Asp
 195 200 205
 Glu Leu Ser Asp Ile His Thr Arg Phe Leu Ser Gln Leu Leu Glu Arg
 210 215 220
 Arg Arg Gln Ala Leu Cys Pro Gly Ser Thr Arg Asn Phe Val Ile His
 225 230 235 240
 Arg Leu Gly Asp Leu Leu Ile Ser Gln Phe Ser Gly Pro Ser Ala Glu
 245 250 255
 Gln Met Cys Lys Thr Tyr Ser Glu Phe Cys Ser Arg His Ser Lys Ala
 260 265 270
 Leu Lys Leu Tyr Lys Glu Leu Tyr Ala Arg Asp Lys Arg Phe Gln Gln
 275 280 285
 Phe Ile Arg Lys Val Thr Arg Pro Ala Val Leu Lys Arg His Gly Val
 290 295 300
 Gln Glu Cys Ile Leu Leu Val Thr Gln Arg Ile Thr Lys Tyr Pro Leu
 305 310 315 320
 Leu Ile Ser Arg Ile Leu Gln His Ser His Gly Ile Glu Glu Glu Arg
 325 330 335
 Gln Asp Leu Thr Thr Ala Leu Gly Leu Val Lys Glu Leu Leu Ser Asn
 340 345 350

Val Asp Glu Gly Ile Tyr Gln Leu Glu Lys Gly Ala Arg Leu Gln Glu
 355 360 365
 Ile Tyr Asn Arg Met Asp Pro Arg Ala Gln Thr Pro Val Pro Gly Lys
 370 375 380
 Gly Pro Phe Gly Arg Glu Glu Leu Leu Arg Arg Lys Leu Ile His Asp
 385 390 395 400
 Gly Cys Leu Leu Trp Lys Thr Ala Thr Gly Arg Phe Lys Asp Val Leu
 405 410 415
 Val Leu Leu Met Thr Asp Val Leu Val Phe Leu Gln Glu Lys Asp Gln
 420 425 430
 Lys Tyr Ile Phe Pro Thr Leu Asp Lys Pro Ser Val Val Ser Leu Gln
 435 440 445
 Asn Leu Ile Val Arg Asp Ile Ala Asn Gln Glu Lys Gly Met Phe Leu
 450 455 460
 Ile Ser Ala Ala Pro Pro Glu Met Tyr Glu Val His Thr Ala Ser Arg
 465 470 475 480
 Asp Asp Arg Ser Thr Trp Ile Arg Val Ile Gln Gln Ser Val Arg Thr
 485 490 495
 Cys Pro Ser Arg Glu Asp Phe Pro Leu Ile Glu Thr Glu Asp Glu Ala
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 Tyr Leu Arg Arg Ile Lys Met Glu Leu Gln Gln Lys Asp Arg Ala Leu
 515 520 525
 Val Glu Leu Leu Arg Glu Lys Val Gly Leu Phe Ala Glu Met Thr His
 530 535 540
 Phe Gln Ala Glu Glu Asp Gly Gly Ser Gly Met Ala Leu Pro Thr Leu
 545 550 555 560
 Pro Arg Gly Leu Phe Arg Ser Glu Ser Leu Glu Ser Pro Arg Gly Glu
 565 570 575
 Arg Leu Leu Gln Asp Ala Ile Arg Glu Val Glu Gly Leu Lys Asp Leu
 580 585 590
 Leu Val Gly Pro Gly Val Glu Leu Leu Leu Thr Pro Arg Glu Pro Ala
 595 600 605
 Leu Pro Leu Glu Pro Asp Ser Gly Gly Asn Thr Ser Pro Gly Val Thr
 610 615 620
 Ala Asn Gly Glu Ala Arg Thr Phe Asn Gly Ser Ile Glu Leu Cys Arg
 625 630 635 640

Ala Asp Ser Asp Ser Ser Gln Arg Asp Arg Asn Gly Asn Gln Leu Arg
 645 650 655
 Ser Pro Gln Glu Glu Ala Leu Gln Arg Leu Val Asn Leu Tyr Gly Leu
 660 665 670
 Leu His Gly Leu Gln Ala Ala Val Ala Gln Gln Asp Thr Leu Met Glu
 675 680 685
 Ala Arg Phe Pro Glu Gly Pro Glu Arg Arg Glu Lys Leu Cys Arg Ala
 690 695 700
 Asn Ser Arg Asp Gly Glu Ala Gly Arg Ala Gly Ala Ala Pro Val Ala
 705 710 715 720
 Pro Glu Lys Gln Ala Thr Glu Leu Ala Leu Leu Gln Arg Gln His Ala
 725 730 735
 Leu Leu Gln Glu Glu Leu Arg Arg Cys Arg Arg Leu Gly Glu Glu Arg
 740 745 750
 Ala Thr Glu Ala Gly Ser Leu Glu Ala Arg Leu Arg Glu Ser Glu Gln
 755 760 765
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 Ala Ala Leu Gly Gln Thr Glu Pro Leu Pro Ala Glu Ala Pro Trp Ala
 785 790 795 800
 Arg Arg Pro Val Asp Pro Arg Arg Arg Ser Leu Pro Ala Gly Asp Ala
 805 810 815
 Leu Tyr Leu Ser Phe Asn Pro Pro Gln Pro Ser Arg Gly Thr Asp Arg
 820 825 830
 Leu Asp Leu Pro Val Thr Thr Arg Ser Val His Arg Asn Phe Glu Asp
 835 840 845
 Arg Glu Arg Gln Glu Leu Gly Ser Pro Glu Glu Arg Leu Gln Asp Ser
 850 855 860
 Ser Asp Pro Asp Thr Gly Ser Glu Glu Glu Gly Ser Ser Arg Leu Ser
 865 870 875 880
 Pro Pro His Ser Pro Arg Gly Glu Thr Leu Ala Glu Thr Trp Thr Arg
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 Asp Phe Thr Arg Met Gln Asp Ile Pro Glu Glu Thr Glu Ser Arg Asp
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 Gly Glu Ala Val Ala Ser Glu Ser
 915 920

<210> 3
 <211> 18
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 3
 Arg Arg Arg Ser Leu Pro Ala Gly Asp Ala Leu Tyr Leu Ser Phe Asn
 1 5 10 15

Pro Pro

<210> 4
 <211> 18
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 4
 Arg Gln Ser Leu Leu Gly Ser Arg Arg Gly Arg Ser Ser Leu Ser Leu
 1 5 10 15

Ala Lys

<210> 5
 <211> 10
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 5
 Arg Gly Glu Thr Leu Ala Glu Thr Trp Thr
 1 5 10

<210> 6
 <211> 6
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic peptide

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 <222> (2)
 <223> basic amino acid

<220>
 <221> MOD_RES
 <222> (4)
 <223> hydrophobic amino acid

<220>
 <221> MOD_RES
 <222> (5)
 <223> any amino acid

<400> 6
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 1 5

<210> 7
 <211> 20
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic peptide

<400> 7
 Cys Pro Arg Arg Arg Ser Leu Pro Ala Gly Asp Ala Leu Tyr Leu Ser
 1 5 10 15

Phe Asn Pro Pro
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<210> 8
 <211> 19
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic peptide

<400> 8
 Cys Arg Gln Ser Leu Leu Gly Ser Arg Arg Gly Arg Ser Ser Leu Ser
 1 5 10 15

Leu Ala Lys

<210> 9
 <211> 19
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 9
 Cys Arg Gln Ser Leu Leu Gly Ser Arg Arg Gly Arg Ser Ser Leu Ser
 1 5 10 15

Leu Ala Lys

<210> 10
 <211> 31
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
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<400> 10
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31

<210> 11
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 11
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27

<210> 12
 <211> 28
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 12

atcctgctgg tgaccatggg catcacca

28

<210> 13

<211> 26

<212> DNA

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<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 13

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26

<210> 14

<211> 26

<212> DNA

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<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 14

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26

<210> 15

<211> 6

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic
peptide

<400> 15

Gln Arg Ile Thr Lys Tyr

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5

<210> 16

<211> 27

<212> DNA

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<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 16

gcagaattct gtaacaagag catcaca

27

<210> 17

<211> 32

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 17

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32

<210> 18

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 18

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<210> 19

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<220>

<221> MOD_RES

<222> (12)

<223> phosphorylated Thr

<400> 19

Leu	Cys	Leu	Cys	Arg	Arg	Lys	Ser	Leu	Val	Gly	Thr	Pro	Tyr	Trp	Met
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Ala Pro Glu

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<210> 20
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<212> PRT
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence: Synthetic peptide

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<220>  
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<222> (2)  
<223> basic amino acid
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<220>  
<221> MOD_RES  
<222> (4)  
<223> hydrophobic amino acid
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<220>  
<221> MOD_RES  
<222> (5)  
<223> any amino acid
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<400> 20
Arg Xaa Ser Xaa Xaa Leu
1 5

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<210> 21
<211> 52
<212> PRT
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence: Synthetic
      polypeptide
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<400> 21
Cys Thr Pro Ala Ala Pro Ala Val Pro Ala Val Pro Gly Pro Pro Gly
  1             5             10             15

```

Pro Arg Ser Pro Gln Arg Glu Pro Gln Arg Val Ser His Glu Gln Phe
20 25 30

Arg Ala Ala Leu Gln Leu Val Val Asp Pro Gly Asp Pro Arg Ser Tyr
35 40 45

Leu Asp Asn Phe
50

<210> 22
 <211> 25
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 polypeptide

<400> 22
 Arg Val Ser His Glu Gln Phe Arg Ala Ala Leu Gln Leu Val Val Asp
 1 5 10 15
 Pro Gly Asp Pro Arg Ser Tyr Leu Asp
 20 25

<210> 23
 <211> 17
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 23
 Cys Ser Gly Asp Arg Arg Arg Ala Gly Pro Glu Lys Arg Pro Lys Ser
 1 5 10 15

Ser

<210> 24
 <211> 8
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

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 <222> (3)
 <223> any amino acid

<220>
 <221> MOD_RES
 <222> (6)..(7)
 <223> any amino acid and this range may encompass one or
 two residues

<400> 24

Arg Arg Xaa Ser Leu Xaa Xaa Gly
1 5

<210> 25

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<220>

<221> MOD_RES

<222> (2)

<223> any basic amino acid

<220>

<221> MOD_RES

<222> (4)

<223> any hydrophobic amino acid

<220>

<221> MOD_RES

<222> (5)

<223> any amino acid

<220>

<221> MOD_RES

<222> (6)

<223> Gly or Leu

<400> 25

Arg Xaa Ser Xaa Xaa Xaa
1 5

<210> 26

<211> 31

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 26

gcggaattca tgtctcggat cgaatccctc a

<210> 27
 <211> 26
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 27
 gtcactgagc tcgtccacgc agggga

26

<210> 28
 <211> 18
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<220>
 <221> MOD_RES
 <222> (14)
 <223> phosphorylated Ser

<400> 28
 Arg Arg Arg Ser Leu Pro Ala Gly Asp Ala Leu Tyr Leu Ser Phe Asn
 1 5 10 15

Pro Pro

<210> 29
 <211> 18
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<220>
 <221> MOD_RES
 <222> (4)
 <223> phosphorylated Ser

<400> 29
 Arg Arg Arg Ser Leu Pro Ala Gly Asp Ala Leu Tyr Leu Ser Phe Asn
 1 5 10 15

Pro Pro

<210> 30
 <211> 18
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<220>
 <221> MOD_RES
 <222> (12)
 <223> phosphorylated Tyr

<400> 30
 Arg Arg Arg Ser Leu Pro Ala Gly Asp Ala Leu Tyr Leu Ser Phe Asn
 1 5 10 15

Pro Pro

<210> 31
 <211> 24
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 31
 Cys Ala Thr Thr Ala Arg Gly Gly Pro Gly Lys Ala Gly Ser Arg Gly
 1 5 10 15

Arg Phe Ala Gly His Ser Glu Ala
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<210> 32
 <211> 49
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 32
 Cys Thr Pro Ala Ala Pro Ala Val Pro Gly Pro Pro Gly Pro Arg Ser
 1 5 10 15

Pro Gln Arg Glu Pro Gln Arg Val Ser His Glu Gln Phe Arg Ala Ala
 20 25 30

Leu Gln Leu Val Val Asp Pro Gly Asp Pro Arg Ser Tyr Leu Asp Asn
 35 40 45

Phe

<210> 33

<211> 56

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 peptide

<400> 33

Ser Tyr Leu Ser Ser Leu Ser Leu Ser Ser Ser Thr Tyr Pro Pro Pro
 1 5 10 15

Ser Trp Gly Ser Ser Ser Asp Gln Gln Pro Ser Arg Val Ser His Glu
 20 25 30

Gln Phe Arg Ala Ala Leu Gln Leu Val Val Ser Pro Gly Asp Pro Arg
 35 40 45

Glu Tyr Leu Ala Asn Phe Ile Lys
 50 55

<210> 34

<211> 54

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 peptide

<400> 34

Ile Ser Thr Ser Asn Leu Tyr Leu Pro Gln Asp Pro Thr Val Ala Lys
 1 5 10 15

Gly Ala Leu Ala Gly Glu Asp Thr Gly Val Val Thr His Glu Gln Phe
 20 25 30

Lys Ala Ala Leu Arg Met Val Val Asp Gln Gly Asp Pro Arg Leu Leu
 35 40 45

Leu Asp Ser Tyr Val Lys
50

<210> 35
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<220>
<221> MOD_RES
<222> (4)
<223> Variable amino acid

<220>
<221> MOD_RES
<222> (7)
<223> Variable amino acid

<400> 35
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1 5

<210> 36
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 36
Pro Arg Arg Lys Ser Leu Val Gly Thr Pro Tyr Trp Met Ala Pro Glu
1 5 10 15

<210> 37
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 37
Pro Arg Pro Phe Ser Asp Tyr Gly Gln Leu Ala Ser Arg Ser Leu
1 5 10 15

<210> 38
 <211> 14
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 38
 Arg Arg Arg Thr Phe Pro Gly Val Ala Ser Arg Arg Asn Pro
 1 5 10

<210> 39
 <211> 15
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 39
 Pro Arg Pro Leu Ser Met Pro Ala Asp Gly Asn Trp Met Gly Ile
 1 5 10 15

<210> 40
 <211> 15
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 40
 Arg Arg Arg Trp Leu Leu Pro Asp Pro Glu Phe Pro Leu Ser Leu
 1 5 10 15

<210> 41
 <211> 15
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 41

Arg	Arg	Gln	Thr	Arg	Val	Ile	Arg	Thr	Gly	Arg	Asp	Arg	Gly	Ser
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<210> 42

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 42

Arg	Arg	Arg	Val	Ser	Leu	Pro	Val	Ala	Met	Glu	Glu	Glu	Ile	Ala	Ala
1				5					10					15	

Leu Val

<210> 43

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 43

Pro	Arg	Arg	Leu	Ser	Leu	Gly	Ser	Pro	Glu	Ser	Arg	Ala	Val	Gly	Leu
1				5					10					15	

<210> 44

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<220>

<221> MOD_RES

<222> (14)

<223> Variable or undetermined amino acid

<400> 44

Gly	Arg	Arg	Cys	Ser	Leu	Thr	Gly	Ser	Glu	Gly	Lys	Phe	Xaa	Gly	Leu
1				5					10					15	

Trp Gly

<210> 45
 <211> 19
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 45
 Pro Arg Arg Arg Ser Leu Pro Ala Gly Asp Ala Leu Tyr Leu Ser Phe
 1 5 10 15

Asn Pro Pro

<210> 46
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 46
 Ser Arg Arg Arg Arg Phe Thr Ile Ala Asp Ser Asp Gln Leu Pro Gly
 1 5 10 15

Tyr Ser Val Glu Thr
 20

<210> 47
 <211> 18
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 47
 Ser Arg Arg Gly Arg Ser Ser Leu Ser Leu Ala Lys Ser Val Ser Thr
 1 5 10 15

Thr Asn

<210> 48
 <211> 38
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 48
 Pro Phe Leu Gln Leu Ala Tyr Gln Ser Ser Glu Val Leu Ser Glu Arg
 1 5 10 15
 Gln Ser Leu Leu Leu Ser Gln Lys Gln His Gln Glu Leu Leu Lys Ser
 20 25 30
 Asn Gly Ala Asn Arg Asp
 35

<210> 49
 <211> 46
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 49
 Ser Leu Arg Ser Lys Thr Thr Ile Arg Glu Arg Pro Ser Ser Ala Ile
 1 5 10 15
 Tyr Pro Ser Asp Ser Phe Arg Gln Ser Leu Leu Gly Ser Arg Arg Gly
 20 25 30
 Arg Ser Ser Leu Ser Leu Ala Lys Ser Val Ser Thr Thr Asn
 35 40 45

<210> 50
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 <212> PRT
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<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 50
 Gln Thr His Asp Ser Met Ala Ser Phe Ser Ser Ser His Met Lys Arg
 1 5 10 15

Val Ser Asp Val Leu Pro Lys Arg Arg Thr Thr Ser Ser Ser Phe Glu
 20 25 30

Ser Glu Ile Lys Ser Ile Ser Glu Asn
 35 40

<210> 51
 <211> 44
 <212> PRT
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<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 51
 Gly Gln Thr Glu Pro Leu Pro Ala Glu Ala Pro Trp Ala Arg Arg Pro
 1 5 10 15

Val Asp Pro Arg Arg Arg Ser Leu Pro Ala Gly Asp Ala Leu Tyr Leu
 20 25 30

Ser Phe Asn Pro Pro Gln Pro Ser Arg Gly Thr Asp
 35 40

<210> 52
 <211> 19
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 52
 Cys Arg Arg Arg Ser Leu Pro Ala Gly Asp Ala Leu Tyr Leu Ser Phe
 1 5 10 15

Asn Pro Pro